

## PATENT CLAIMS

1. Differential pressure means (4) for a gas meter  
arrangement (1) which comprises a gas meter (2) in a  
5 bypass (3) to a gas pipe (5) for measuring a gas  
consumption through the gas pipe (5), the  
differential pressure means (4) being designed to be  
mounted in the gas pipe (5) and having a plurality of  
flow ducts (40), which have a typical diameter ( $D_1$ ,  
10 ...,  $D_4$ ), flow ducts (40) being provided in various  
radial positions ( $R_1$ ,  $R_2$ ,  $R_3$ ) on the differential  
pressure means (4), characterised in that
  - a) those flow ducts (40) which are arranged on the  
differential pressure means (4) closer to a  
15 radial position ( $R_1$ ) which is close to the centre  
have a larger diameter ( $D_1$ ,  $D_2$ ), and
  - b) those flow ducts (40) which are arranged on the  
differential pressure means (4) closer to a  
radial position ( $R_3$ ) which is close to the  
20 perimeter have a larger diameter ( $D_3$ ,  $D_4$ ).
2. Differential pressure means (4) according to claim 1,  
characterised in that the flow ducts (40) have  
diameters ( $D_1 > D_2 > D_3 > D_4$ ) which decrease monotonically as  
25 the radial position ( $R_1$ ,  $R_2$ ,  $R_3$ ) increases, starting  
from a central axis (A) of the differential pressure  
means (4).
3. Differential pressure means (4) according to one of  
30 the preceding claims, characterised in that
  - a) inlet ports (41) and/or outlet ports (42) of the  
flow ducts (40) have countersink angles ( $\alpha$ ), and

- b) especially in that the countersink angles ( $\alpha$ ) are in the range  $30^{\circ}$ - $90^{\circ}$ , preferably  $45^{\circ}$ - $75^{\circ}$ , by particular preference  $55^{\circ}$ - $65^{\circ}$ .

- 5     4. Differential pressure means (4) according to one of the preceding claims, characterised in that
  - a) a ratio of the total length (L) to the total diameter ( $D_0$ ) of the differential pressure means (4) is selected to be greater than 1, preferably 1.3 and by particular preference 1.5, and/or
  - 10     b) the flow ducts (40) have a round cross-section and the typical diameter ( $D_1, \dots, D_4$ ) is the diameter ( $D_1, \dots, D_4$ ) of inlet ports (41) of the flow ducts (40), and/or
  - 15     c) the flow ducts (40) have a constant flow cross-section over the entire length (L) of the differential pressure means (4).
- 20     5. Differential pressure means (4) according to one of the preceding claims, characterised in that
  - a) the flow ducts (40) are arranged equidistant on concentric circles (7) on the cross-sectional area (Q) of the differential pressure means (4), and/or
  - 25     b) the cross-sectional area (Q) of the differential pressure means (4) has an aperture ratio in a range  $0.3 \dots 0.8$ , preferably  $0.3 \dots 0.6$ , especially  $0.4 \dots 0.5$ .
- 30     6. Gas meter arrangement (1) for measuring a gas consumption, especially in the private, public or industrial domain, comprising a gas meter (2), which is arranged in a bypass (3) to a gas pipe (5), and a

differential pressure means (4) which is arranged in the gas pipe (5) and has a plurality of flow ducts (40), which have a typical diameter ( $D_1, \dots, D_4$ ), flow ducts (40) being provided in various radial positions ( $R_1, R_2, R_3$ ) on the differential pressure means (4), characterised in that

- a) those flow ducts (40), the radial position ( $R_1, R_2, R_3$ ) of which lies closer to an inlet port (3a) of the bypass (3), have a smaller diameter ( $D_1, \dots, D_4$ ), and
- b) those flow ducts (40), the radial position of which ( $R_1, R_2, R_3$ ) is further away from an inlet port (3a) of the bypass (3), have a larger diameter ( $D_1, \dots, D_4$ ).

7. Gas meter arrangement (1) according to claim 6, characterised in that,

- a) an inlet port (3a) and an outlet port (3b) of the bypass (3) are arranged on a side wall (5a) of the gas pipe (5), and/or
- b) a linear span ( $L'$ ) of the bypass (3) is selected to be larger than or equal to a total length ( $L$ ) of the differential pressure means (4) and the differential pressure means (4) is arranged in the gas pipe (5) between the inlet port (3a) and the outlet port (3b) of the bypass (3).

8. Gas meter arrangement (1) according to claim 7a, characterised in that the flow ducts (40) have diameters ( $D_1 > D_2 > D_3 > D_4$ ) which decrease monotonically as the radial position ( $R_1, R_2, R_3$ ) increases, starting from a central axis (A) of the differential pressure means (4).

9. Gas meter arrangement (1) according to one of claims 6-8, characterised in that the differential pressure means (4) is embodied in accordance with one of claims 3-5.

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10. Gas meter arrangement (1) according to one of claims 6-9, characterised in that

a) the gas meter (2) has a thermal flow sensor, especially a CMOS anemometer, with a heating wire and at least one temperature sensor arranged upstream and/or downstream, and/or

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b) the gas meter (2) has means for calibrating the gas consumption in units of volume under standard conditions (l/min) and/or energy units (kW/h).

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